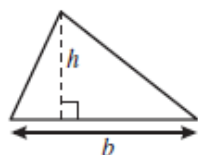


Math 6
SOL Review
Booklet
2011-2012

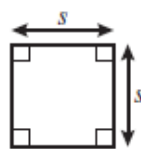
Grade 6 Mathematics Formula Sheet

2009 Mathematics Standards of Learning

Geometric Formulas

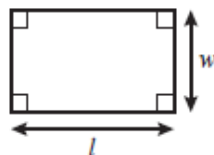


$$A = \frac{1}{2}bh$$



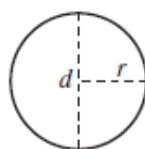
$$p = 4s$$

$$A = s^2$$



$$p = 2l + 2w$$

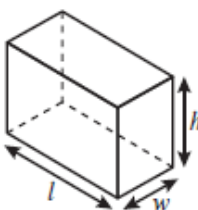
$$A = lw$$



$$C = 2\pi r$$

$$C = \pi d$$

$$A = \pi r^2$$



$$V = lwh$$

$$S.A. = 2lw + 2lh + 2wh$$

Pi

$$\pi \approx 3.14$$

$$\pi \approx \frac{22}{7}$$

Abbreviations

milligram	mg
gram	g
kilogram	kg
milliliter	mL
liter	L
kiloliter	kL
millimeter	mm
centimeter	cm
meter	m
kilometer	km
square centimeter	cm ²
cubic centimeter	cm ³

ounce	oz
pound	lb
quart	qt
gallon	gal.
inch	in.
foot	ft
yard	yd
mile	mi.
square inch	sq in.
square foot	sq ft
cubic inch	cu in.
cubic foot	cu ft

Area	<i>A</i>
Circumference	<i>C</i>
Perimeter	<i>p</i>
Surface Area	<i>S.A.</i>
Volume	<i>V</i>

SOL 6.1

The student will describe and compare data, using ratios, and will use appropriate notations, such as $\frac{a}{b}$, a to b , and $a:b$.

b

HINTS & NOTES

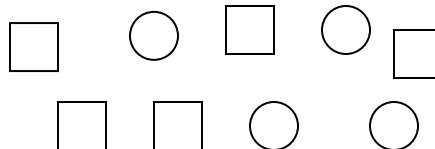
**** Make sure that you write the ratio in the order that is asked****

Simplify all ratios!!!

Ratios can be written 3 different ways:

PRACTICE

1. What is the ratio of squares to all shapes?



- A 4:5
- B 5:4
- C 5:9
- D 9:5

2. Tyriq owns a guitar store with 150 guitars in stock. He has 90 electric guitars and the rest are acoustic. What is the ratio of acoustic to electric guitars?

- A 2 to 3
- B 3 to 2
- C 3 to 5
- D 2 to 5

3. There are 20 green disks and 100 purple disks in a bag. What is the ratio of purple disks to green disks?

- A $\frac{5}{1}$
- B $\frac{1}{5}$
- C $\frac{6}{1}$
- D $\frac{4}{5}$

SOL 6.2

The student will

- a) investigate and describe fractions, decimals, and percents as ratios;**
- b) identify a given fraction, decimal, or percent from a representation;**
- c) demonstrate equivalent relationships among fractions, decimals, and percents; and**
- d) compare and order fractions, decimals, and percents.**

HINTS & NOTES

Percent –

To write a visual as a percent –

Count! Write the amount as a fraction, then convert to a decimal. Convert the decimal to a percent.

To change a fraction to a decimal-

To change a decimal to a percent-

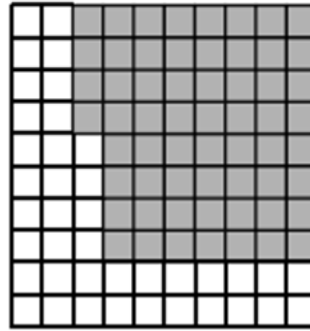
To change a fraction to a percent-

To change a percent to a decimal-

To change a percent to a fraction-

PRACTICE

1. What percent of the grid is shaded?



- A 40%
- B 50%
- C 60%
- D 70%

2. Of the kids in Ms. Bond's class, 40% are boys. Which is the decimal for the part of the class that are boys?

- A .04
- B 0.4
- C 4
- D 40

SOL 6.2 Continued

HINTS & NOTES Continued

Steps for ordering rational numbers (your favorite method):

Ex: 0.5, 10%, $\frac{3}{5}$

Ascending=
Descending=

= is _____ to

< is _____ than

> is _____ than

≠ is not equal to

To compare decimals:

Line up the decimal points, annex zeros, compare from left to right

To compare fractions:

**find a common denominator, then
make equivalent fractions**

OR

change to decimals

OR

use pictures to check

Example:

$$\frac{1}{4} \quad \frac{2}{3}$$

PRACTICE Continued

3. Which statement is true?

A. $\frac{1}{5} > \frac{1}{4}$

B. $\frac{2}{3} > \frac{6}{7}$

C. $\frac{3}{4} > \frac{7}{12}$

D. $\frac{3}{8} > \frac{6}{11}$

4. Which decimals are in ascending order?

A 0.009, 0.8, 0.05, 1.0

B 0.009, 0.05, 0.8, 1.0

C 1.0, 0.05, 0.8, 0.009

D 1.0, 0.8, 0.05, 0.009

5. Which of the following is in descending order?

A $\frac{3}{4}$, 0.5, 35%

B 0.5, $\frac{3}{4}$, 35%

C 0.5, 35%, $\frac{3}{4}$

D 35%, $\frac{3}{4}$, 0.5

SOL 6.3

The student will

- a) identify and represent integers;
- b) order and compare integers; and
- c) identify and describe absolute value of integers.

HINTS & NOTES

Remember – integers are the set of all

_____.

It can be helpful to graph the integers on a **number line**.

The point furthest to the **left** would have the _____ **value**.

The point furthest to the **right** would be the _____ **value**

Positive integers - are greater than zero.

Negative integers - are less than zero.

Zero - is **neither** positive or negative.

******A negative integer is always less than a positive integer. ******

PRACTICE

1. Which of the following is true?

- A $-16 = 16$
- B $-29 > 24$
- C $-47 < -43$
- D $-70 < -77$

2. The temperatures this week were recorded in the chart below. Which day had the highest temperature?

Day	Temperature
Monday	-6°
Tuesday	-11°
Wednesday	-3°
Thursday	-9°
Friday	-4°

- A Monday
- B Tuesday
- C Wednesday
- D Friday

3. Which integer is less than -7 ?

- A -9
- B -5
- C 0
- D 2

4. Which of the following is true?

- A $-16 = 16$
- B $-29 > 24$
- C $-47 < -43$
- D $-70 < -77$

SOL 6.4

The student will demonstrate multiple representations of multiplication and division of fractions.

HINTS & NOTES

Multiplication of fractions can be represented with an *array*.

Model each fraction in one direction. Where they overlap is the solution to the problem.

Example: $\frac{3}{4} \times \frac{1}{5} =$

Draw a picture:

Division of fractions can be represented by looking at the number of pieces that fit in a whole.

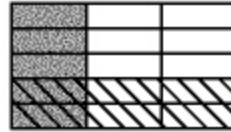
Examples: $3 \div \frac{2}{3}$

$$\frac{3}{4} \div \frac{1}{8}$$

$$1 \frac{4}{5} \div \frac{2}{5} =$$

PRACTICE

1. Which expression is represented by the model below?



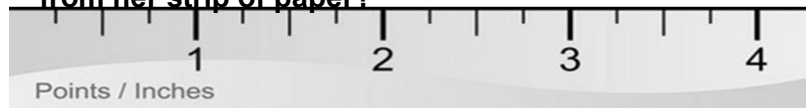
A $\frac{1}{3} \times \frac{2}{5}$

B $\frac{3}{5} \times \frac{1}{3}$

C $\frac{5}{6} \times \frac{2}{3}$

D $\frac{5}{6} \times \frac{3}{5}$

2. Kylee is making an art project with little $\frac{1}{2}$ inch pieces of tissue paper. She has a strip of paper that is $3 \frac{1}{4}$ inches long. How many pieces can she cut from her strip of paper?



A $1 \frac{1}{2}$

B 6

C $6 \frac{1}{2}$

D $2 \frac{3}{4}$

SOL 6.5

The student will investigate and describe concepts of positive exponents and perfect squares.

HINTS & NOTES

Exponent – shows how many times a
is _____ used as a factor.

Ex: $5^3 =$

Perfect square – a number whose
square root is a whole number.

Example:

4 is a perfect square because $\sqrt{4} = 2$

Perfect square numbers are:

Square root – one of two identical
factors of a number

PRACTICE

1. Based on the geometric pattern shown,
what is the value of 5^5 ?

$$5^1 = 5$$

$$5^2 = 25$$

$$5^3 = 225$$

- A 10
- B 25
- C 625
- D 3125

2. Which of the following numbers is *not* a perfect
square?

- A 49
- B 60
- C 81
- D 121

3. Which of the following is equivalent to $7 \times 7 \times 7 \times 7$?

- A 14^2
- B 49^3
- C 7^4
- D 4^7

SOL 6.6

The student will

- a) multiply and divide fractions and mixed numbers; and
 b) estimate solutions and then solve single-step and multistep practical problems involving addition, subtraction, multiplication, and division of fractions.

HINTS & NOTES**When multiplying fractions –**

Make sure to simplify!

“Of” - usually means to multiply

Taking part **of** a part.

Example:

$$\frac{1}{3} \times \frac{4}{5}$$

$$2\frac{1}{4} \times 1\frac{2}{3}$$

When dividing fractions –Remember: All mixed numbers must *first* be converted into improper fractions!

**Remember, if the problem says ‘about’, ‘close to’, or ‘estimate’ start by estimating *all* the numbers in the problem. Think *friendly* numbers!

PRACTICE

1. Which fraction is equivalent to $\frac{5}{6} \div \frac{1}{3}$?

A $\frac{5}{18}$

B $\frac{2}{5}$

C $1\frac{1}{6}$

D $2\frac{1}{2}$

2. Kiara’s muffin recipe calls $\frac{3}{4}$ cups of flour. She only has $\frac{1}{3}$ cup flour. How much more flour does she need for her muffins?

A $\frac{2}{12}$

C $\frac{3}{12}$

B $\frac{4}{12}$

D $\frac{5}{12}$

3. Matt plans on running $\frac{5}{8}$ of a mile every day this week, and then $1\frac{1}{3}$ every day next week. About how far will he have run at the

- A 7 miles
 B 13 miles
 C 17 miles
 D 28 miles

SOL 6.7

The student will solve single-step and multistep practical problems involving addition, subtraction, multiplication, and division of decimals.

HINTS & NOTES

When working with word problems remember to use the 5 step process:

The word ***per*** means “for each”.
Example – ***Price per pound*** means “price for each pound”.

Always ESTIMATE first!

PRACTICE

1. The table shows the prices for CDs at 4 different stores.

CD Prices

Store	Number of CDs	Total Price
Budget Buy	4	\$30.00
CD City	2	\$15.99
Music Mall	3	\$21.99
Shop Smart	1	\$8.99

Which store has the lowest price per CD?

- F** Budget Buy
- G** CD City
- H** Music Mall
- J** Shop Smart

2. The cost of dinner for three is \$20.25. Which is the best estimate for the price per person of a meal?

- F.** \$2.50
- G.** \$5.50
- H.** \$7.00
- J.** \$10.25

3. **Price for Different Types of Reeds**

Item	Number of Reeds per Box	Price per Box
Clarinet reeds	10	\$5.13
Oboe reeds	1	\$4.95
Alto saxophone reeds	5	\$8.42

Based on this table, what is the cost to buy 10 of each different type of reed?

- A** \$18.50
- B** \$26.92
- C** \$71.47
- D** \$98.35

SOL 6.8

The student will evaluate whole number numerical expressions, using the order of operations.

HINTS & NOTES

The order of operations says:

Remember that when multiplying or dividing **AND** when adding or subtracting you always work from _____ to _____.

PRACTICE

1. What number is equal to $2 \cdot 8 - 4 \div 4$?

A 2
B 3
C 14
D 15

2. When simplifying the following using order of operations, which operation should be performed first?

$$11 \div (12 - 8 \cdot 3) + 2^4$$

A $11 \div 12$
B $12 - 8$
C $8 \cdot 3$
D 2^4

SOL 6.9

The student will make ballpark comparisons between measurements in the U.S. Customary System of measurement and measurements in the metric system.

HINTS & NOTES**Ballpark Conversions-**

1 inch is about _____centimeters.

1 foot is about _____centimeters.

1 meter is a little _____ than
a _____.

1 mile is slightly _____ than 1.5
kilometers.

1 kilometer is slightly farther than
half a mile.

1 _____ is about 28 grams.

1 nickel has the mass of about 5
grams.

1 kilogram is a little more than
_____ pounds.

1 quart is a little _____ than 1
liter.

1 liter is a little _____ than 1
quart.

PRACTICE

1. Ariel participated in the Monument Avenue 10 km Race. About how many miles did she run in the race?

- A 6 miles
- B 10 miles
- C 16 miles
- D 20 miles

2. Mrs. Martin's science class was studying insects. They found a caterpillar that measured 2.5 inches in length. About how many centimeters long was it?

- A 1 cm
- B 2.5 cm
- C 5 cm
- D 10 cm

3. Sally's recipe for fruit punch calls for 1 gallon of lemonade. The store does not sell lemonade in gallons. Which of the following amounts should Sally buy?

- A 1 liter
- B 4 liters
- C 1 milliliter
- D 4 milliliters

SOL 6.10

The student will

- a) define π (pi) as the ratio of the circumference of a circle to its diameter;
- b) solve practical problems involving circumference and area of a circle, given the diameter or radius;
- c) solve practical problems involving area and perimeter; and
- d) describe and determine the volume and surface area of a rectangular prism.

HINTS & NOTES

Diameter- a straight line passing through the _____ of a circle and meeting the circumference or surface at each end.

Radius - _____ the length of the diameter.

EX: If the radius is 10 cm, the diameter is _____ cm.

EX: If the diameter is 24 m, the radius is _____ m.

π (π) \approx _____ -this is the ratio of a circle's circumference to its _____.

Circumference of a circle - distance around the outside of a circle

C=
or
C=

Area of a circle - amount of flat space inside a circle

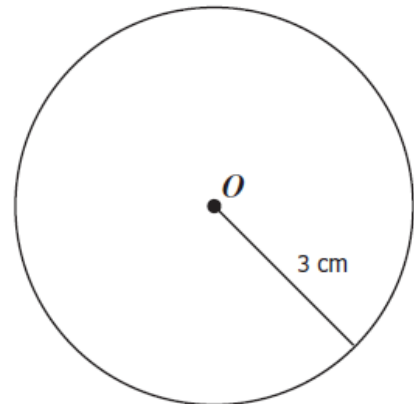
A=

PRACTICE

1. Bob is trying to grow grass on the circular section of yard below. If the diameter of the circle is 6 yards, how much seed will he need to cover the entire area?

- A 18.84 yds.²
- B 28.26 yds.²
- C 113.04 yds.²
- D 254.34 yds.²

Which is closest to the circumference of circle *O* shown?



- F 113.04 cm
- G 75.36 cm
- H 37.68 cm
- J 18.84 cm

Rory and Curtis are on the stage crew for the school play. The rectangular stage measures 20 feet by 40 feet. What is the minimum amount of tape they will need to outline the stage?

- A 60 feet
- B 120 feet
- C 400 feet
- D 800 feet

SOL 6.10

The student will

- a) define π (pi) as the ratio of the circumference of a circle to its diameter;
- b) solve practical problems involving circumference and area of a circle, given the diameter or radius;
- c) solve practical problems involving area and perimeter; and
- d) describe and determine the volume and surface area of a rectangular prism.

HINTS & NOTES

If the question is asking for the distance around something, it is asking for _____.

If the question is asking for the amount needed to cover or the amount of space something takes, it is asking for _____.

Formulas:

PeRIMeter – sum of all sides

Area of rectangle –

A =

Area of square –

A =

Area of triangle –

A =

Volume is the amount of 3D space a solid figure occupies.

Volume of a rectangular prism

V =

Surface area is the total area of all the sides of a solid figure added up (how much it would take to cover it).

Surface Area of a rectangular prism

SA=

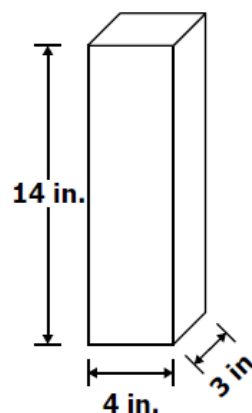
PRACTICE

1. How many square inches of fabric does Kendall need for a triangular flag with a base of 20 inches and a height of 40 inches?



- A. 800 in.²
- B. 400 in.²
- C. 120 in.²
- D. 100 in.²

2. This diagram shows a rectangular prism.



What is the total surface area of this prism?

- F 110 square inches
- G 168 square inches
- H 208 square inches
- J 220 square inches

3. What is the volume of the rectangular prism in question #2?

SOL 6.11

The student will

- a) identify the coordinates of a point in a coordinate plane; and
b) graph ordered pairs in a coordinate plane.

HINTS & NOTES

The horizontal axis is called the

_____.

The vertical axis is called the

_____.

There are _____ quadrants in the coordinate plane.

All points on a two-dimensional plane take the form (x, y)

The points in each quadrant have specific signs.

Quadrant I are (+, +)

Quadrant II are (,)

Quadrant III are (,)

Quadrant IV are (,)

The **point (0, 0)** is called the

_____.

When plotting points on the coordinate plane always move horizontally first, then vertically.

PRACTICE

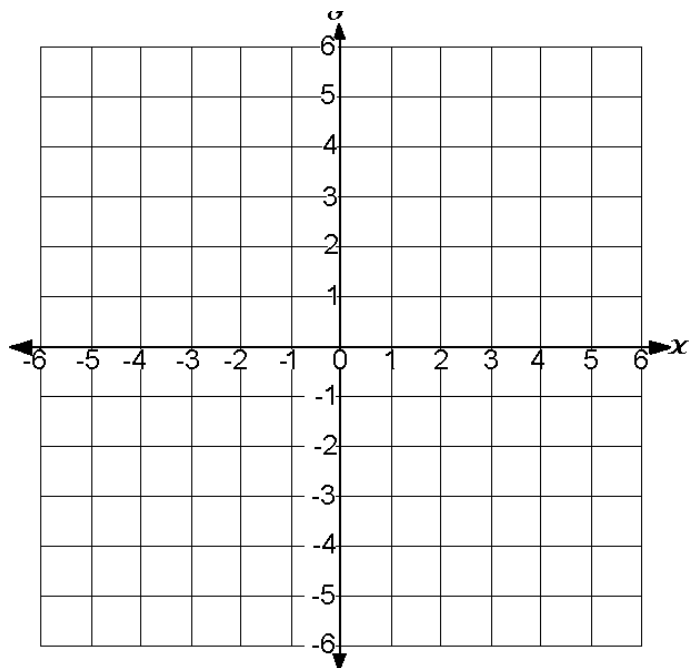
In which quadrant is the point (17, 18) located?

- A** Quadrant I
B Quadrant II
C Quadrant III
D Quadrant IV

2. Write the coordinates of a point located on the x-axis.

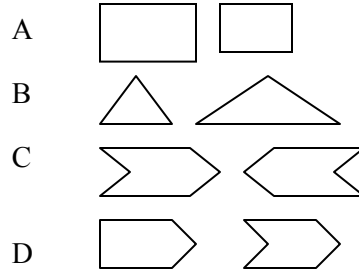
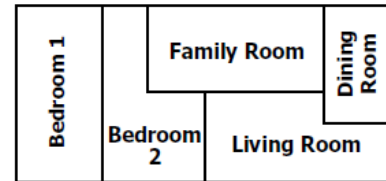
(,)

3. Plot the point (-3, 5) on the coordinate grid below.



SOL 6.12

The student will determine congruence of segments, angles, and polygons.

HINTS & NOTES**Congruent polygons****Congruent segments****Congruent angles****PRACTICE****1. Which shapes are congruent?****2. Nikki drew a sketch of the floor plan of her home.**

Which two rooms in Nikki's sketch appear to be congruent?

- F** Bedroom 1 and Family Room
- G** Dining Room and Bedroom 1
- H** Living Room and Bedroom 2
- J** Living Room and Dining Room

3. Congruent line segments must have which of the following characteristics?

- A Be pointing in the same directions
- B Be the same length
- C Have the same name
- D Contain less than 2 points

SOL 6.13

The student will describe and identify properties of quadrilaterals.

HINTS & NOTES**Quadrilaterals**

Trapezoid – figure has exactly _____ of parallel sides

Kite—is a quadrilateral with two pairs of _____ congruent sides. One pair of opposite angles is _____.

Parallelogram – _____ of parallel sides. Opposite sides are _____.

Rectangle – _____ with four _____ angles. Opposite sides are _____.

Rhombus – _____ with four _____ sides. *Usually* has 2 _____ angles and 2 _____ angles.

Square – _____ with four _____ angles and four _____ sides.

***The sum of the measures of the interior angles of a quadrilateral always equals _____.**

PRACTICE

1. Which two figures *always* have four right angles?

- F. parallelogram and rectangle
- G. square and equilateral triangle
- H. square and rhombus
- J. rectangle and square

2. Which of the following shapes is *not* a parallelogram?

- A Trapezoid
- B Rectangle
- C Rhombus
- D Square

3. Which property is common to all quadrilaterals?

- A Four angles
- B Four congruent sides
- C Opposite sides parallel
- D Opposite angles congruent

4. A trapezoid is a quadrilateral with exactly —

- A one pair of congruent sides
- B one pair of parallel sides
- C four congruent angles
- D four congruent sides

SOL 6.14

The student, given a problem situation, will

- a) construct circle graphs;
- b) draw conclusions and make predictions, using circle graphs; and
- c) compare and contrast graphs that present information from the same data set.

HINTS & NOTES

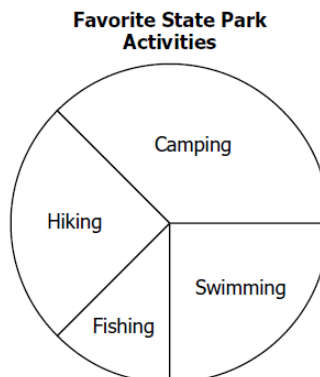
Circle graph— used to compare
_____ to
a _____.

To make a circle graph:

1. If not in percents find the
_____ part of the total data
for each category.
2. Multiply the fraction
by _____.
3. Measure each angle and label
the categories.

PRACTICE

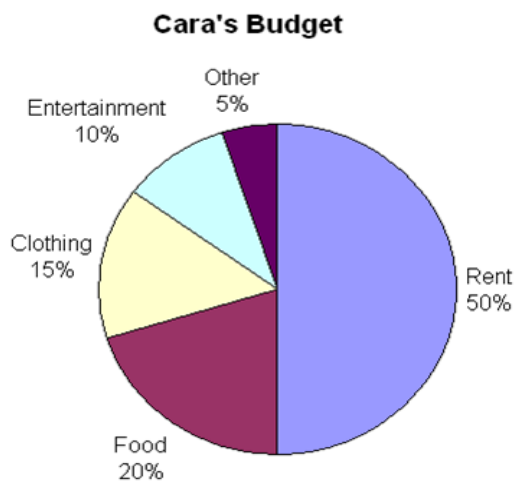
The first 200 visitors to a state park were asked about their favorite park activity. The results are shown in this circle graph.



Which of the following is *closest* to the number of these 200 visitors who said hiking was their favorite activity?

- F** 25 visitors
- G** 40 visitors
- H** 50 visitors
- J** 75 visitors

2.



If Cara's budget is \$200, how much more did she spend on food than clothing?

SOL 6.15

The student will

- a) describe mean as balance point; and
b) decide which measure of center is appropriate for a given purpose.

HINTS & NOTES

Mean– the total distance of all the data points below the mean must _____ the total distance of all the points above the mean.

This is why **mean** is sometimes called the _____ of a set of data.

Mean – find by:

The mean is good to use when you don't have any outliers.

Median – is the _____ piece of data when the data is in order.

The median is good to use when you have an outlier.

Mode – the item that occurs _____ often

The mode is good to use with categorical data, or if there is a piece of data that happens much more frequently than the others..

Range – the difference between the greatest and least values in

PRACTICE

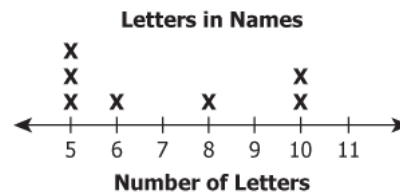
1. For the data listed below, which would be the **best measure of center?**

76, 79, 75, 77, 74

- A mean
- B median
- C mode
- D range

2.

This line plot shows the number of letters in the names of 7 students.



Each **X** represents 1 student.

What is the balance point for this set of data?

- ☐ **A** 5 letters
- ☐ **B** 6 letters
- ☐ **C** 7 letters
- ☐ **D** 8 letters

3. Write a set of 6 pieces of data that would **best** be described using the median.

SOL 6.16

The student will

- a) compare and contrast dependent and independent events; and
- b) determine probabilities for dependent and independent events.

HINTS & NOTES

Always write probability as a fraction first

Ex: P(5) on a die=

Don't forget to **SIMPLIFY** fractions.

When finding probability of two or more events, find the probability of each event and then _____ the fractions to find the probability of both things happening.

Independent events are two (or more) events that have *no* impact on each others probability.

Example: flipping a coin and _____.

A key phrase is "*with replacement*"

Dependent events are two (or more) events that do impact each others probability.

Example: pulling a marble out of a bag and _____.

Key phrase is "*without replacement*"

PRACTICE

1. Taquana reached into a drawer containing 5 blue and 5 black socks. She pulled out one blue sock. While still holding that sock she reached in and grabbed another sock.

Would this be an example of independent or dependent probability?

2. What is the probability that Taquana grabbed two blue socks?

- A $\frac{2}{9}$
- B $\frac{1}{4}$
- C $\frac{1}{2}$
- D $\frac{1}{5}$

3. When playing a game in math class the students must spin a four colored spinner and roll a die to determine how they move. What is the probability of spinning red and rolling a 4?

- A $\frac{1}{12}$
- B $\frac{1}{4}$
- C $\frac{1}{8}$
- D $\frac{1}{24}$

SOL 6.17**The student will identify and extend geometric and arithmetic sequences.****HINTS & NOTES**

Arithmetic Sequence- a number pattern created by _____

Example:

Geometric Sequence- a number pattern created by _____

Example:

Draw out patterns and leave spaces when you have to skip ahead in a pattern. Don't just pick the next number.

Ex: Find the 7th term in the pattern.

2, 5, 8, 11, _____, _____, _____

PRACTICE

1)

What would be the 7th term in the sequence

4, 7, 10, 14,...

- A 17
- B 20
- C 23
- D 26

2)

Find the common ratio for the sequence:

3, 6, 12, 24,...

3)

Find the common difference for the sequence:

32, 16, 8, 4...

- A 4
- B -4
- C 2
- D -2

4)

Extend the geometric sequence to the 6th term:

100, 50, 25, ...

SOL 6.18

The student will solve one-step linear equations in one variable involving whole number coefficients and positive rational solutions.

HINTS & NOTES

Variable –

Coefficient –

Term –

Equation -.

Remember to use inverse operations to solve equations:

To undo addition –

To undo subtraction –

To undo multiplication –

To undo division –

Always do the exact same things to both sides of an equation!!!

PRACTICE

1. Which method could be used to solve the number sentence shown?

$$x + 9 = 12$$

- A Add 9 to both sides of the equation
- B Subtract 9 from both sides of the equation
- C Multiply both sides of the equation by 9
- D Subtract 12 from both sides of the equation

2. What value of y makes the equation true?

$$3y = 36$$

- A y = 108
- B y = 39
- C y = 33
- D y = 12

3. Which word describes the boxed number?

$$\boxed{8}x = y$$

- F Term
- G Variable
- H Equation
- J Coefficient

4. What is the solution to the following?

$$\frac{n}{6} = 36$$

- F n = 6
- G n = 30
- H n = 42
- J n = 216

SOL 6.19

The student will investigate and recognize

- a) the identity properties for addition and multiplication;
- b) the multiplicative property of zero; and
- c) the inverse property for multiplication.

HINTS & NOTES

Identity property for addition—
any number plus _____ will
equal _____.

Identity property for multiplication—
any number times
will

equal _____.

Example:

Multiplicative property of zero—
any number times _____ will
equal _____.

Example:

Inverse property of multiplication—
A number multiplied by its
_____ will
equal 1.

PRACTICE

1. Which of the equations below is an example of the inverse property for addition?

- A $5 + 0 = 5$
- B $6 \times 0 = 0$
- C $5 + -5 = 0$
- D $6 \times 1 = 6$

2.

$$\frac{1}{7} \cdot y = \frac{1}{7}$$

If the number sentence is true, then y is the —

- F additive identity
- G additive inverse
- H multiplicative identity
- J multiplicative inverse

3. Write in the term that would make the equation true. Name the property demonstrated.

$$\frac{4}{5} \bullet \boxed{} = 1$$

SOL 6.20

The student will graph inequalities on a number line.

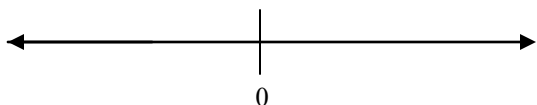
HINTS & NOTES

< is _____ than

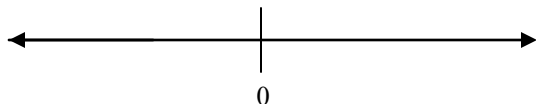
> is _____ than

 \leq is _____ or _____ to \geq is _____ or _____ to

For showing less than, or greater than you must use an _____ circle, then shade in all the numbers that would make the statement true.

Example: Graph $x < 3$ 

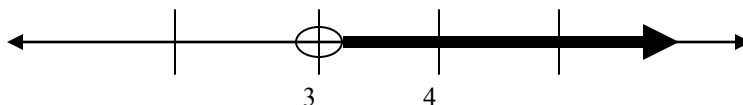
For showing less than or equal to, or greater than or equal to, use a _____ circle then shade all the numbers that would make the statement true.

Example: Graph $x \geq 3$ 

Be careful if the variable is not on the right side of the inequality. Watch your signs!

PRACTICE

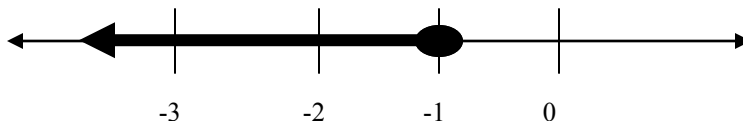
1. Which inequality is shown on the graph be-



- A $x \geq 3$
- B $x \leq 3$
- C $x > 3$
- D $x < 3$

2. Graph the equation $x \leq 2$ on the number line below.

3. Select the inequality that best represents the given graph.



- A $-1 \geq x$
- B $-1 \leq x$
- C $x > -1$
- D $x < -1$